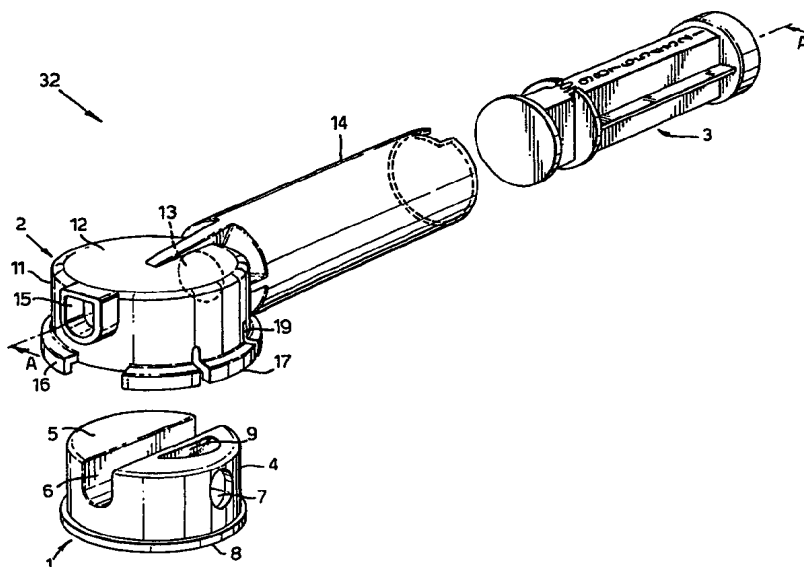




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : G01F 11/26	A1	(11) International Publication Number: WO 00/37897 (43) International Publication Date: 29 June 2000 (29.06.00)
(21) International Application Number: PCT/GB99/04039 (22) International Filing Date: 2 December 1999 (02.12.99) (30) Priority Data: 9828055.5 18 December 1998 (18.12.98) GB (71) Applicant (for all designated States except US): HOECHST SCHERING AGREVO GMBH [DE/DE]; Miraustrasse 54, D-13509 Berlin (DE). (72) Inventors; and (75) Inventors/Applicants (for US only): ADAMS, Andrew, John [GB/DE]; D-65926 Frankfurt am Main (DE). BOYD, Graham [GB/GB]; 5 York Terrace, York Street, Chester CH1 3LR (GB). NOEDING, Gunnar [DE/DE]; D-65926 Frankfurt am Main (DE). (74) Agent: SEWELL, Richard, Charles; AgrEvo UK Limited, Patent Dept., Chesterford Park, Saffron Walden, Essex CB10 1XL (GB).		(81) Designated States: AU, BR, CA, CN, CZ, HU, IL, IN, JP, KR, MX, NZ, PL, RU, TR, UA, US, ZA, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>

(54) Title: DISPENSER**(57) Abstract**

A handheld dispenser for metering flowable material such as granules or powders. The dispenser comprises a vessel and an assembly attached to the vessel and rotatable about the vessel between first and second positions. The assembly has a dispensing outlet and a metering chamber. In the first position the metering chamber is in fluid communication, via the aperture, with the vessel but not with the outlet. In the second position, the metering chamber is in fluid communication with the outlet but not with the vessel. The portion of the vessel which attaches to the assembly is shaped to define a channel such that when the assembly is attached to the vessel and adopting the second position, the channel and the assembly define a passageway which connects the outlet with the chamber. The aperture is positioned substantially on the same radial plane as the channel.

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Dispenser

The invention relates to handheld dispensers and an aspect thereof, for metering flowable material, particularly but not exclusively granules or powders.

5

A variety of industrial, agricultural household operations require the metered dispensing of flowable material, for example metering of an accurate quantity of concentrated material prior to dilution. Typically such operations involve the step of transferring material from a supply vessel into a separate metering receptacle, which is then used to dispense the material. Such an operation is inconvenient and time-consuming, and indeed, may not be possible if dispensing is to be performed outdoors, particularly during inclement weather. These problems are exacerbated if hazardous material requires dispensing.

15 We have now developed a dispenser that addresses the above-mentioned problems.

According to a first aspect of the invention, there is provided a handheld dispenser comprising: a vessel for holding material to be dispensed, the vessel having an aperture; and an assembly attached to the vessel and rotatable between first and second positions, which assembly has a dispensing outlet and a metering chamber; whereby, in the first position the metering chamber is in fluid communication, via the aperture, with the vessel but not with the outlet and in the second position, the metering chamber is in fluid communication with the outlet but not with the vessel, characterised in that the portion of the vessel which attaches to the assembly, is shaped to define a channel such that when the assembly is attached to the vessel and adopting the second position, the channel and the assembly define a passageway which connects the outlet with the chamber, and where the aperture is positioned substantially on the same radial plane as the channel.

30

To dispense a metered quantity of material using the invention, the assembly is rotated to the position where the aperture is in fluid communication with the metering chamber (first position). The dispenser is then orientated such that

material, contained within the vessel, flows via the aperture and into the metering chamber. Whilst maintaining the dispenser in this orientation, the assembly is rotated to a position where the metering chamber is in fluid communication with the outlet (second position) whereupon the dispenser is orientated so as to
5 dispense the metered amount of material from the metering chamber.

It will be appreciated that using the invention in the fashion described above, material can be metered and dispensed conveniently without exposing the operator to the material, which may be hazardous.

10

Further, the invention enables the manufacture of dispensers that are compact and which can be fabricated using a conventional plastic moulding process at low cost.

15

In addition, when the chamber and the aperture are not in fluid communication, the vessel is completely sealed. This feature of our invention provides several advantages. Firstly, it prevents moisture entering the vessel, which may affect the materials fluent properties, particularly if it is hygroscopic. Thus, hygroscopic material can be stored in the dispenser for prolonged periods without requiring
20 further protection from moisture. Secondly, this feature makes the dispenser a practical device, enabling it to be carried in any orientation without the risk of spillage, for example in a pocket or rucksack.

According to a second aspect of the invention, there is provided a metering device
25 comprising: an adapter for attachment to a vessel, which adapter has an aperture; and an assembly attached to the adapter and rotatable between first and second positions, which assembly has a dispensing outlet and a metering chamber; whereby, in the first position the metering chamber is in fluid communication, via the aperture, with the vessel but not with the outlet and, in the second position,
30 the metering chamber is in fluid communication with the outlet but not with the vessel, characterised in that the portion of the vessel which attaches to the assembly, is shaped to define a channel such that when the assembly is attached to the vessel and adopting the second position, the channel and the assembly

define a passageway which connects the outlet with the chamber, and where the aperture is positioned substantially on the same radial plane as the channel.

This aspect has all the advantages described for the first aspect, and additionally enables the invention to be used in conjunction with vessels of different capacities. Furthermore, it is envisaged that this device may encourage industry to establish a standardised vessel connector for connection with the adapter of the device. This would have environmental advantages facilitating the development of returnable vessel systems.

The following preferred embodiments are applicable to either aspect of the invention.

Preferably, the outlet and chamber are diametrically opposed on the assembly about its axis of rotation. A compact dispenser and device is thereby produced.

According to an embodiment of the invention, the assembly is removably attached to the vessel or adapter. This facilitates cleaning of the dispenser or device, for example, if differing materials are successively used.

Preferably the capacity of the metering chamber may be varied. This embodiment is particularly advantageous enabling the dispensing of metered amounts of material independent of its predecessor. Therefore the invention overcomes a drawback inherent with a number of prior art dispensers (for example EP 269 283) wherein the metering chamber is of fixed capacity.

Preferably, the metering chamber is elongate and its capacity may be varied by means of a metering piston movable within an elongate metering cylinder. This embodiment provides a number of advantages. It provides a simple and accurate variable capacity chamber. The elongate chamber allows the operator to rotate the chamber about the vessel or adapter with ease.

We have found that different metering chamber shapes and dimensions enhance the dispensing of certain materials. For example, we have found that powders

having relatively poor flowability are dispensed more efficiently using a metering chamber having a large diameter.

5 In addition, the elongate metering cylinder or piston may incorporate information relating to the amount of material to be dispensed. Such information may be in the form of weight units, for example metric and/or imperial. Additionally, the information may be in the form of dose or application rates, for example USA rates or UK rates. Typically, such information is conveyed by way of graduations, which may be incorporated as part of a moulding process, or added subsequently
10 for example by printing.

Incorporating a transparent portion in the metering cylinder further enhances accurate metering.

15 The invention will now be described, by way of example only, with reference to the Figures.

Figure 1 shows an exploded perspective view of a metering device according to the second aspect of the invention.

20

Figure 2 shows a cross sectional view of the assembled metering device of Figure 1 viewed along axis AA.

Figure 3 shows a cross sectional view of the assembled metering device with the piston extended viewed along axis BB of Figure 2.
25

Figure 4 shows a cross sectional view of the assembled metering device viewed along axis CC of Figure 2.

30 Figures 5 to 7 show the dispensing operation using a dispenser according to the first aspect of the invention.

Referring to the Figures and in particular Figures 1 to 4, there is shown metering device 32 which comprises adapter 1, assembly 2 and metering piston 3.

Adapter 1 comprises a continuous circular wall 4 closed at one end 5, which wall carries an internal thread (not shown) for attachment to a vessel (also not shown). Channel 6 connects diametrically opposed points on the wall 4 and aperture 7 is positioned at a point on the wall equidistant between the ends of the channel. Flange 8 surrounds the rim of wall 4 opposite to closure 5. An internal part of the adapter is shaped so as to provide a deflecting means 9, so as to facilitate passage of material through aperture 7.

10 Assembly 2 comprises a continuous circular wall 11 closed at one end 12, the wall 11 having an opening 13 leading to a metering cylinder 14. Metering cylinder 14 extends radially outwards from wall 11. Wall 11 further contains an outlet 15 diametrically opposed to opening 13. Assembly 12 has a shaped flange 16.

15 Adapter 1 and assembly 2 are sized and shaped such that adapter 1 is a rotatable fit within assembly 2. The size and shape of aperture 7 and opening 13 are equal and positioned such that when assembly 2 and adapter 1 are fitted together and aligned, opening 13 corresponds with aperture 7. In addition the size and shape of the cross-section of channel 6, outlet 15 and opening 13 are equal and positioned
20 such that when assembly 2 and adapter 1 are fitted together and aligned, channel 6 corresponds with outlet 15 and opening 13 (see Figure 3). It will be appreciated that aperture 7 and channel 6 are on the same radial plane defined by the axis of rotation of assembly 2 about adapter 1.

25 In addition, shaped flange 16 on assembly 2 is sized to co-operate with flange 8 on adapter 1. Diametrically opposed portions 17 of shaped flange 16 have a retaining lips 18 extending radially inwards (see Figure 4). Portions 17 are able to move radially independent of the remainder of shaped flange 16 due to cuts 19. The width of lips 18 is such that when assembly 2 and adapter 1 are fitted
30 together, lips 18 snap over flange 8. To remove assembly 2 from adapter 1 outward pressure is applied to disengage lips 18 from flange 8.

A metering piston 3 is sized to be a movable snug-fit within metering cylinder 14 to form metering chamber 20. In use, graduations 21 on piston 3 provide the

operator with information on the quantity of material in the chamber to be dispensed.

Figures 5 to 7 show the dispensing operation with dispenser 30. Dispenser 30
5 comprises vessel 31 connected to metering device 32. Figure 5 shows assembly
2, rotated to a position where aperture 7 coincides with opening 13 so that vessel
31 is in fluid communication with chamber 20. Metering piston 3 is adjusted to
define the capacity of chamber 20. In Figure 6, the dispenser 30 has been
spatially orientated so that material flows from the vessel via aperture 7 and
10 opening 13 into chamber 20. In Figure 7 the assembly is rotated so that outlet 15
and opening 13 on assembly 2 are aligned with channel 6 in adapter 1 to define a
passageway through which the metered amount of material is dispensed.

Claims

- 1 A handheld dispenser comprising: a vessel for holding material to be
dispensed, the vessel having an aperture; and an assembly attached to the
vessel and rotatable between first and second positions, which assembly
5 has a dispensing outlet and a metering chamber; whereby, in the first
position the metering chamber is in fluid communication, via the aperture,
with the vessel but not with the outlet and in the second position, the
metering chamber is in fluid communication with the outlet but not with the
vessel, characterised in that the portion of the vessel which attaches to the
10 assembly, is shaped to define a channel such that when the assembly is
attached to the vessel and adopting the second position, the channel and
the assembly define a passageway which connects the outlet with the
chamber, and where the aperture is positioned substantially on the same
radial plane as the channel.
- 15 2 A handheld dispenser according to claim 1 wherein the assembly is
removably attached to the vessel.
- 3 A handheld dispenser according to any preceding claim wherein the outlet
20 and chamber are diametrically opposed on the assembly about its axis of
rotation.
- 4 A handheld dispenser according to any preceding claim wherein the
capacity of the metering chamber may be varied.
- 25 5 A handheld dispenser according to claim 4 wherein the metering chamber
is elongate and the capacity may be varied by means of a metering piston
moveable within an elongate metering cylinder.
- 30 6 A handheld dispenser according to claim 5 wherein the elongate metering
cylinder or metering piston incorporates information relating to the amount
of material to be dispensed.

8

7 A handheld dispenser according to claims 5 or 6 having a transparent portion in the metering cylinder.

8 A handheld dispenser as hereinbefore described with reference to Figures
5 1, 2 or 3.

9 A metering device comprising: an adapter for attachment to a vessel,
which adapter has an aperture; and an assembly attached to the adapter
and rotatable between first and second positions, which assembly has a
10 dispensing outlet and a metering chamber; whereby, in the first position the
metering chamber is in fluid communication, via the aperture, with the
vessel but not with the outlet and, in the second position, the metering
chamber is in fluid communication with the outlet but not with the vessel,
characterised in that the portion of the vessel which attaches to the
15 assembly, is shaped to define a channel such that when the assembly is
attached to the vessel and adopting the second position, the channel and
the assembly define a passageway which connects the outlet with the
chamber, and where the aperture is positioned substantially on the same
radial plane as the channel.

20

10 A metering device as hereinbefore described with reference to Figures 1, 2
or 3.

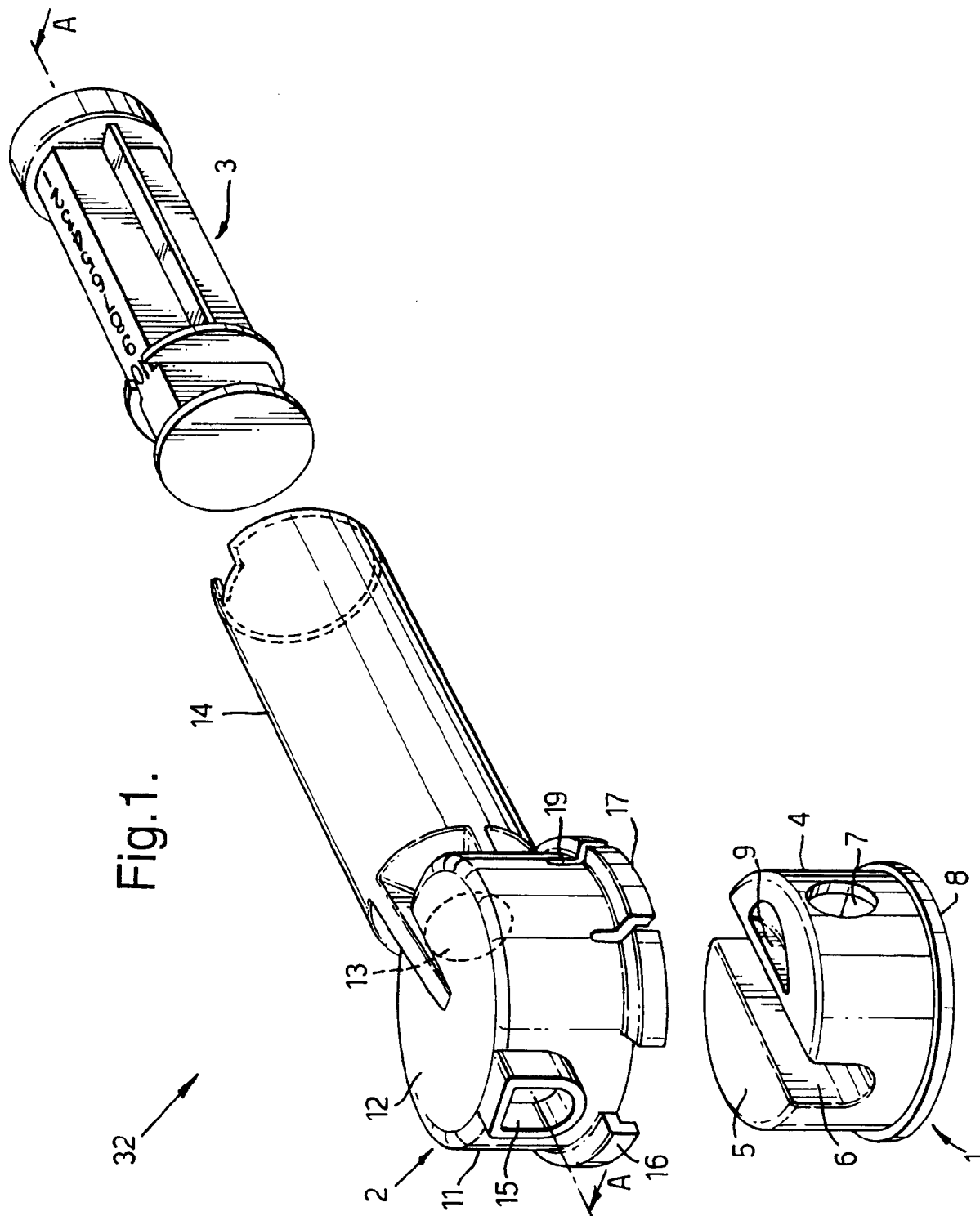


Fig.2.

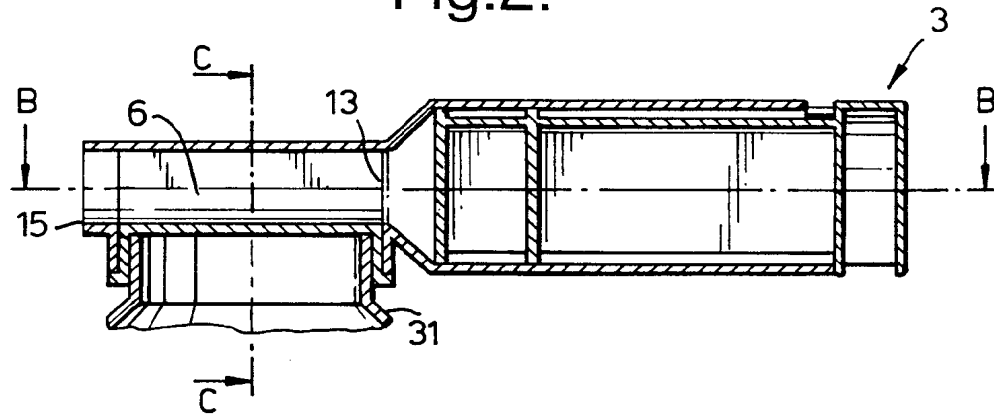


Fig.3.

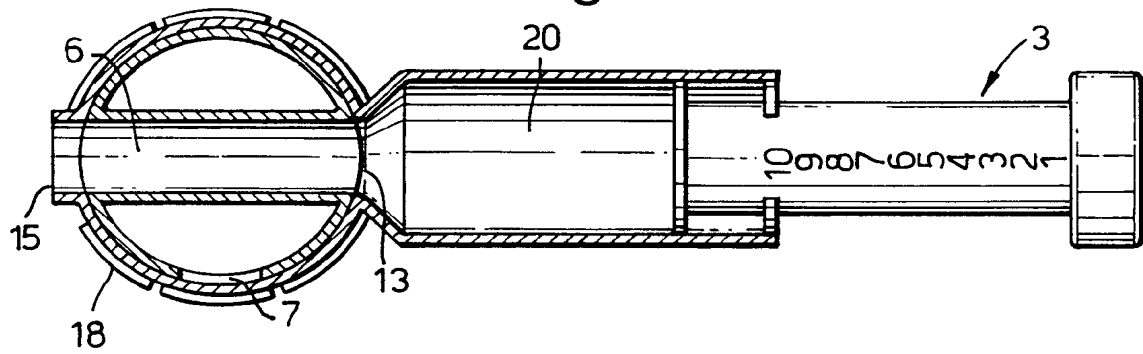
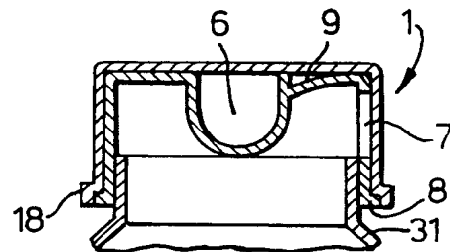


Fig.4.



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Fig.5.

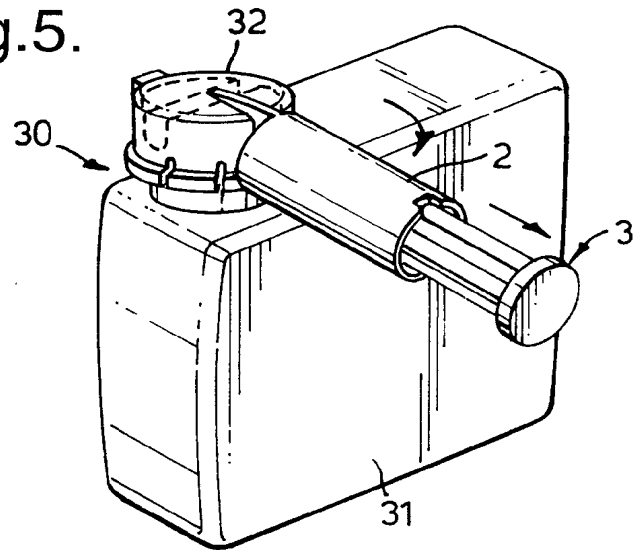


Fig.6.

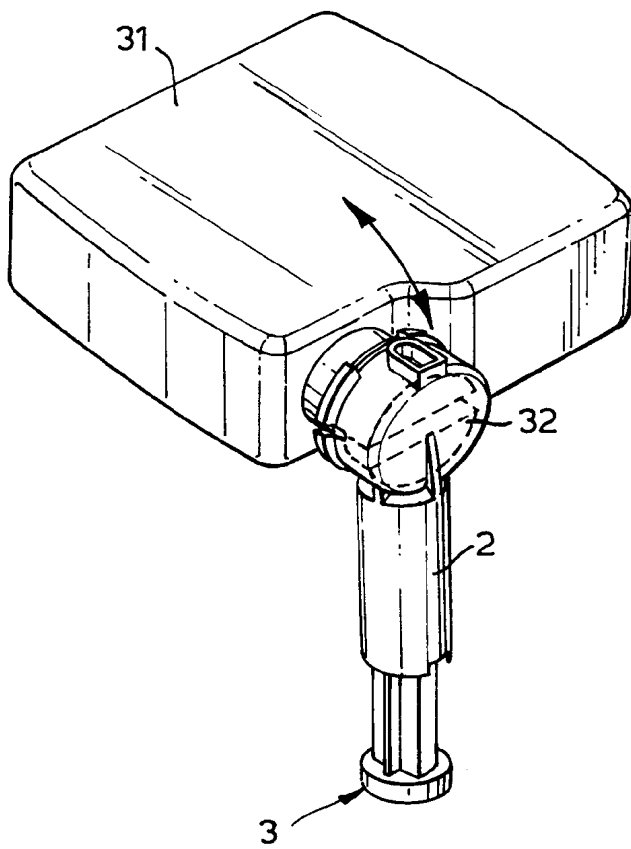
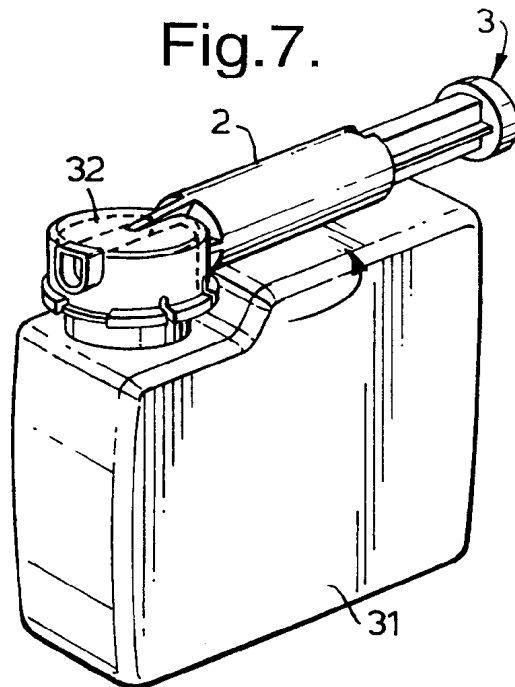


Fig.7.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04039

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01F11/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 169 036 A (TONG VINCENT L Y) 8 December 1992 (1992-12-08) column 3, line 31 -column 4, line 18; figures 2,4 ---	1-10
A	EP 0 446 805 A (CAPSULIT SRL) 18 September 1991 (1991-09-18) column 2, line 53 -column 3, line 41; figures 1,2 ---	1-10
A	EP 0 163 109 A (HENKEL KGAA) 4 December 1985 (1985-12-04) page 8, line 10 -page 9, line 14; figure 1 ---	1-10
A	US 4 989 759 A (GANGLOFF ROBERT B) 5 February 1991 (1991-02-05) column 2, line 54 -column 4, line 4; figures 1-5 -----	1-10

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☒ Patent family members are listed in annex.

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Date of mailing of the international search report

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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
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